Ohio's Wetland Monitoring and Standards Program

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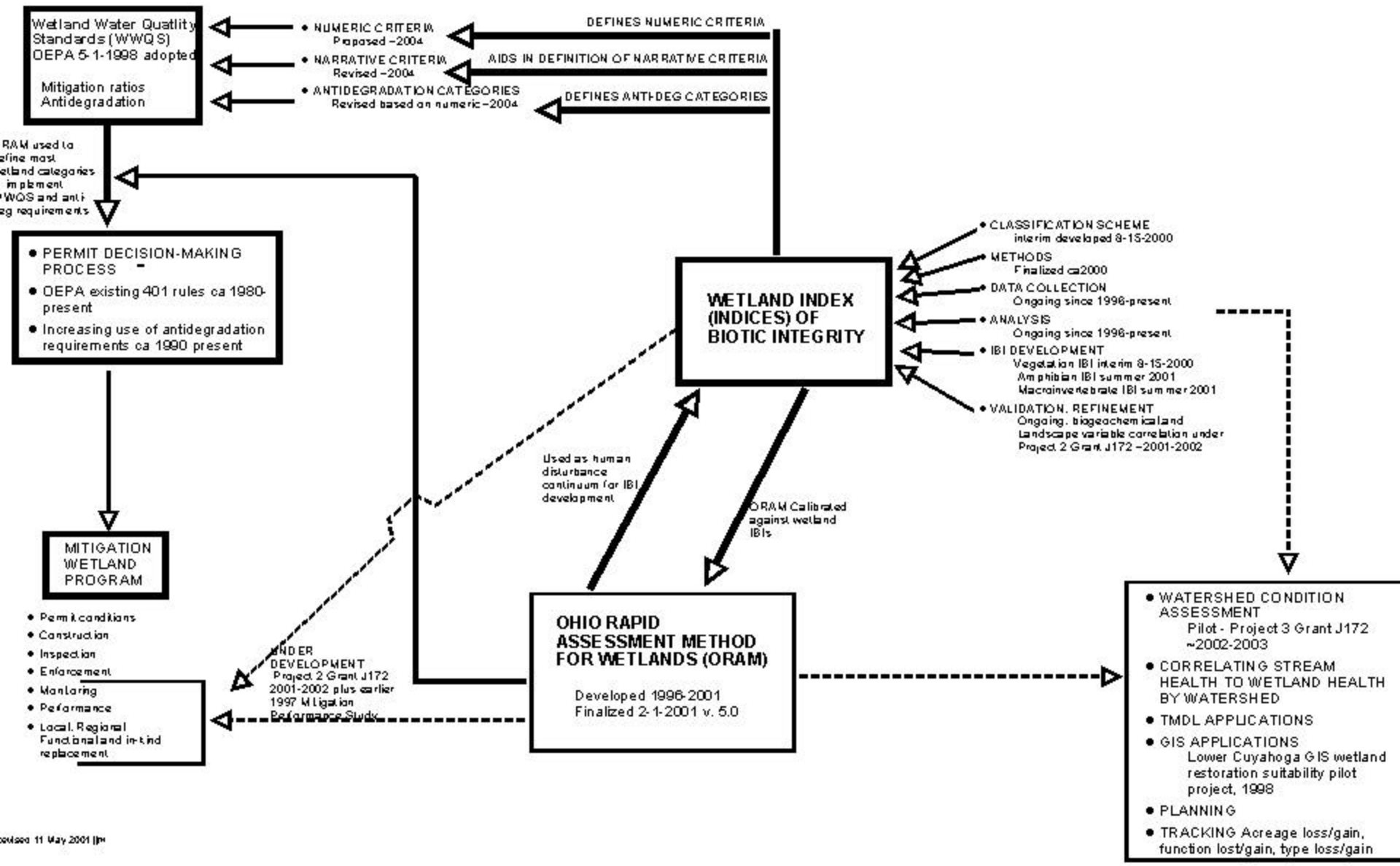
Schematic outline of existing or future components of Ohio wetland regulatory program



Current Elements of Program:

- Wetland Water Quality Standards
  - Narrative criteria and Chemical criteria
  - "Wetland" designated use
  - Antidegradation rule
- Section 401 Certification Program
  - Post-SWANCC isolated wetland state permitting rule
  - Procedural permitting rules for 401s
- Rapid Assessment Method for Wetlands v.5.0
- Interim Indices of Biotic Integrity (IBIs)

Wetland Water Quality Standards (WWQS)
OEPA 5-1-1998 adopted

Mitigation ratios
Antidegradation

- NUMERIC CRITERIA — DEFINES NUMERIC CRITERIA
- Proposed ~2004
- NARRATIVE CRITERIA — AIDS IN DEFINITION OF NARRATIVE CRITERIA
- Revised ~2004
- ANTIDEGRADATION CATEGORIES — DEFINES ANTI-DEG CATEGORIES
  Revised based on numeric ~2004

Ohio's Wetland Water Quality Standards Program

- It took five years of meetings, draft rules and a year long regulatory negotiation to adopt Wetland WQ Standards.
- May 1998 – Adopted Wetland Water Quality Standards.

Basic Structure of Ohio's Wetland Water Quality Standards

- One designated use -"wetland"
- Tiered Antidegradation Rule
- Narrative Criteria
- Numeric Criteria

Wetland Narrative Criteria

- **Hydrology** necessary to support the biological and physical characteristics naturally present in wetlands shall be protected
- **Water quality** necessary to support existing habitats and populations of wetland flora and fauna shall be protected
- **Recreational** opportunities which are wetland dependent shall not be adversely impacted

Wetland Chemical Criteria

- For point source discharges to wetlands, use chemical criteria developed for streams (end of pipe - no mixing zone)
- Applicant can propose alternate site specific criteria to be reviewed by Ohio EPA on a case by case basis

Wetland Antidegradation Rule

- Designed to maintain and protect the designated use
- Establish criteria for allowing a lowering of water quality in higher quality wetlands
- Each wetland is assigned a category for the purposes of antidegradation review
- Categories assigned based on wetland's:
  - Sensitivity to disturbance
  - Rarity
  - Potential for replacement by compensatory mitigation
  - Relative functions and values

Wetland Antidegradation Rule

- The wetland designated use shall be maintained and protected such that degradation through direct, indirect, or cumulative impacts does not result in a net loss of wetland acreage or functions.

Wetland Functions Include:

- Maintenance of biodiversity
- Ground water exchange
- Nutrient removal and recycling
- Sediment and contaminant retention
- Water storage
- Sediment and shoreline stabilization
- Recreation, education, research
- Habitat for threatened/endangered species
- Regional significance of wetland in providing certain functions

Wetland Antidegradation Rule

- Three Wetland Categories
  - Category 1 – supports minimal wetland functions
  - Category 2 – supports moderate wetland functions
  - Category 3 – supports superior wetland functions

Antidegradation Demonstration

- Avoidance
- Minimization
- Mitigation
- Social and Economic Justification– Cat.2&3
- Public Need- Cat. 3

Wetland Categorization

- Director will consider the results of an acceptable wetland evaluation method and other information to fully assess the wetland's functions and values
- The Ohio Rapid Assessment Method for Wetlands Version 5.0 (ORAM 5.0) is currently being used most often and preferred by Ohio EPA

ORAM

- Ohio EPA assembled a group of wetland experts to help develop a wetland rapid assessment methodology (1997-2001)
- Started with the Western Washington Wetland Rating System (ORAM Versions 0.0-4.1)
- ORAM Version 5.0 – major departure

ORAM Version 5.0

- Became final 2/1/01 and includes a Users Manual
- Assesses wetland condition
- Developed from need for a human disturbance (x axis) for bioassessment monitoring
- Includes narrative and quantitative evaluations

Narrative Rating

- State and federal T&E species habitat or occurrence
- Special wetlands – bogs, fens, obvious HQ wetlands, unique habitats (waterfowl, neotropical birds) or obvious low quality wetlands

Quantitative Rating

- Total of 100 points possible
  - Area (6 pts.)
  - Buffer widths and surrounding land uses (14pts.)
  - Hydrology -sources, connectivity, depth, duration, intactness (30 pts.)
  - Habitat - substrate intactness, habitat development, habitat intactness (20 pts.)
  - Special wetland communities (10 pts.)
  - Vegetation, interspersion and microtopography (20 pts.)

Ohio's Wetland Water Quality Standards Program

Elements in progress:

- Numeric biological criteria based on vascular plants, amphibians, and macroinvertebrates (2005)
- Standardized mitigation monitoring and evaluation protocols using IBIs and methods
- Watershed or statewide wetland condition assessment methods

WETLAND INDEX (INDICES) OF BIOTIC INTEGRITY

- •CLASSIFICATION SCHEME
- •interim developed 8-15-2000
- •METHODS
- •Finalized ca2000
- •DATA COLLECTION
- •Ongoing since 1996-present
- •ANALYSIS
- •Ongoing since 1996-present
- •IBI DEVELOPMENT
- •Vegetation IBI interim 8-15-2000, 11-9-2001
- •Amphibian IBI winter 2002
- •Macroinvertebrate IBI summer 2002
- •VALIDATION, REFINEMENT

Ongoing, biogeochemical,and Landscape variable correlation

Developing Wetland IBIs

- Major Goal-
  - Establish “breakpoints” between wetland categories and base regulatory decisions on actual measures of wetland integrity and functionality

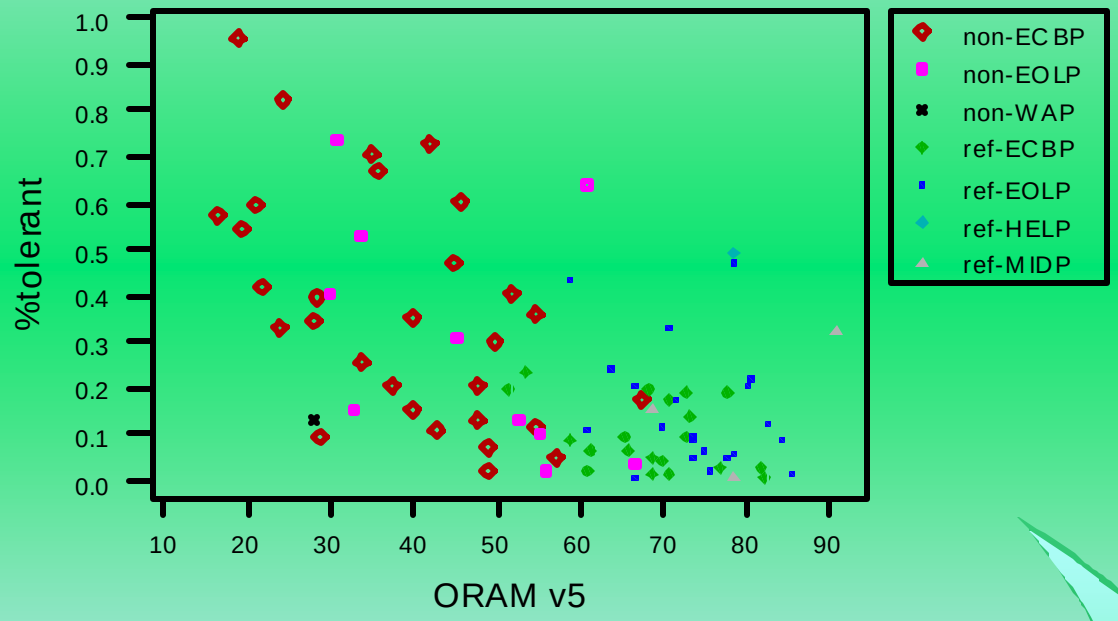
Wetland Biocriteria Development Project

- Develop Indices of Biotic Integrity (IBIs) using plants, amphibians, & macroinvertebrates
- Develop and calibrate rapid assessment method
- Establish wetland categories and rapid assessment method breakpoints using IBIs

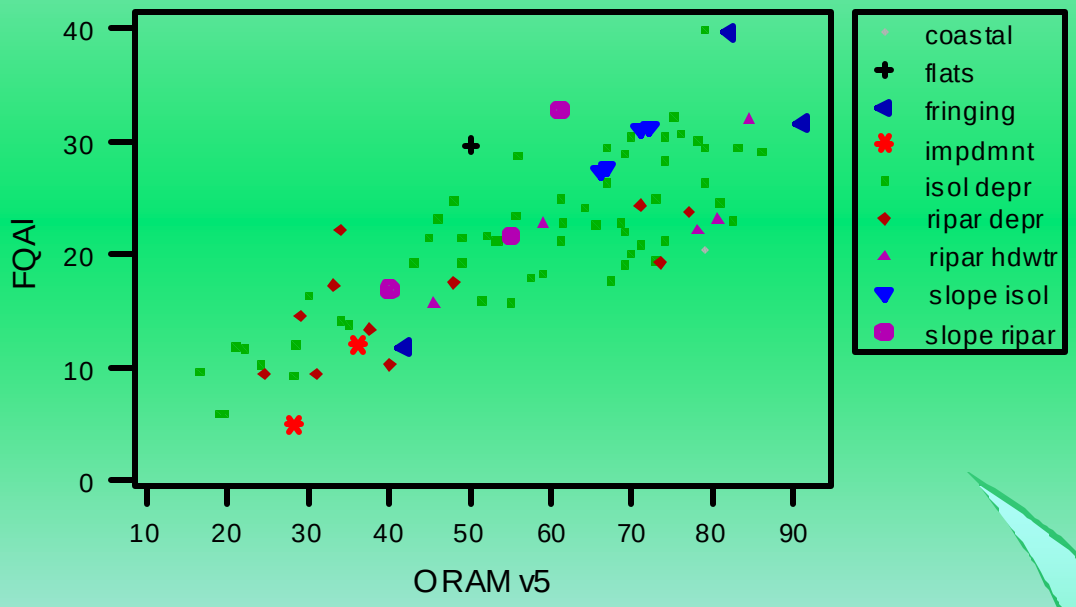
Wetland Biocriteria Monitoring

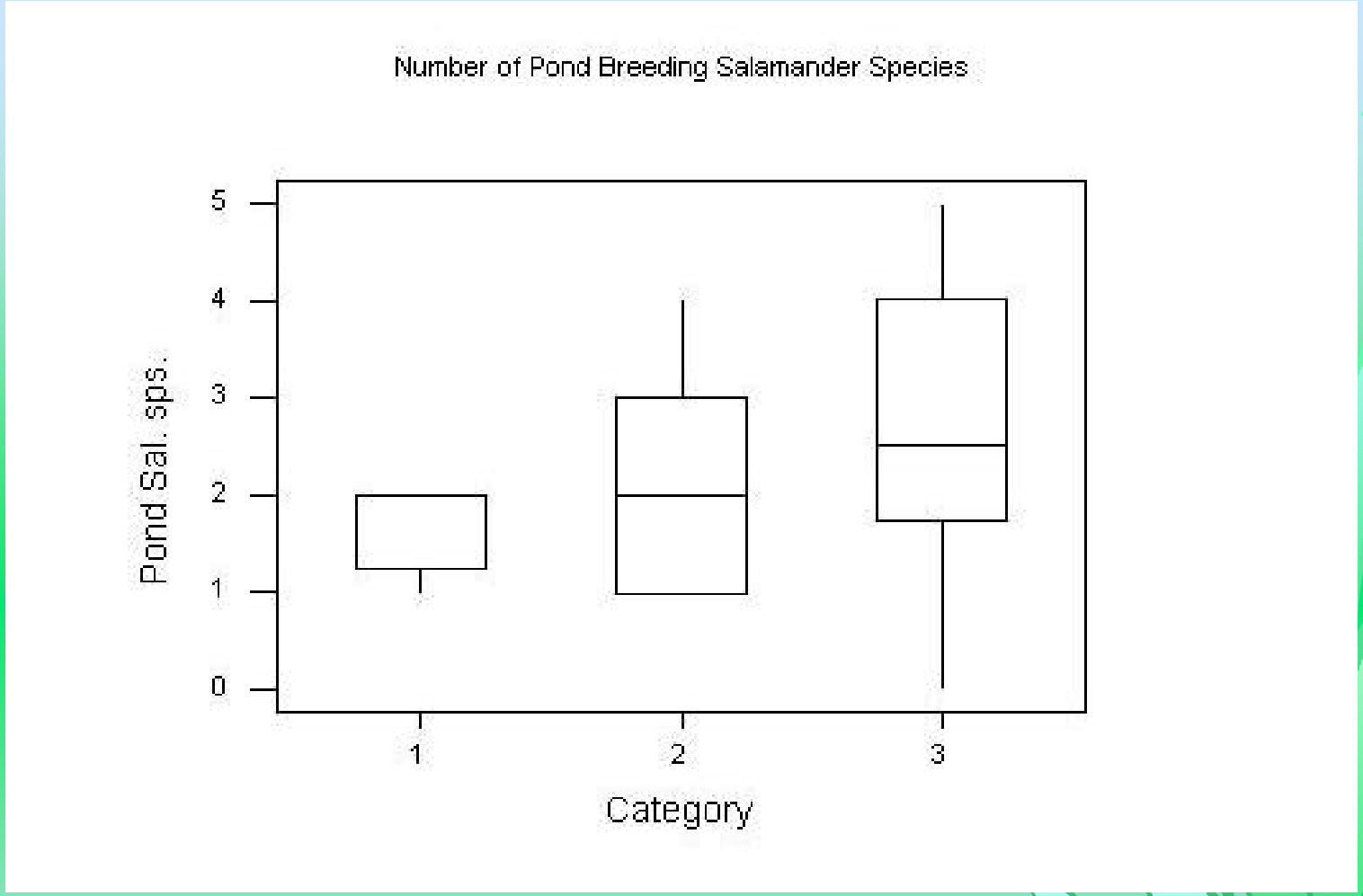
- Wetland Biocriteria Development Project Ohio EPA began work in 1996 on methods, indicator organisms, wetland classification
- Work funded primarily by Wetland Program Development Grants, U.S. EPA, Region 5
- To date, interim IBIs developed using vascular plants; amphibian and macroinvertebrate IBIs to follow

Developing Wetland IBIs



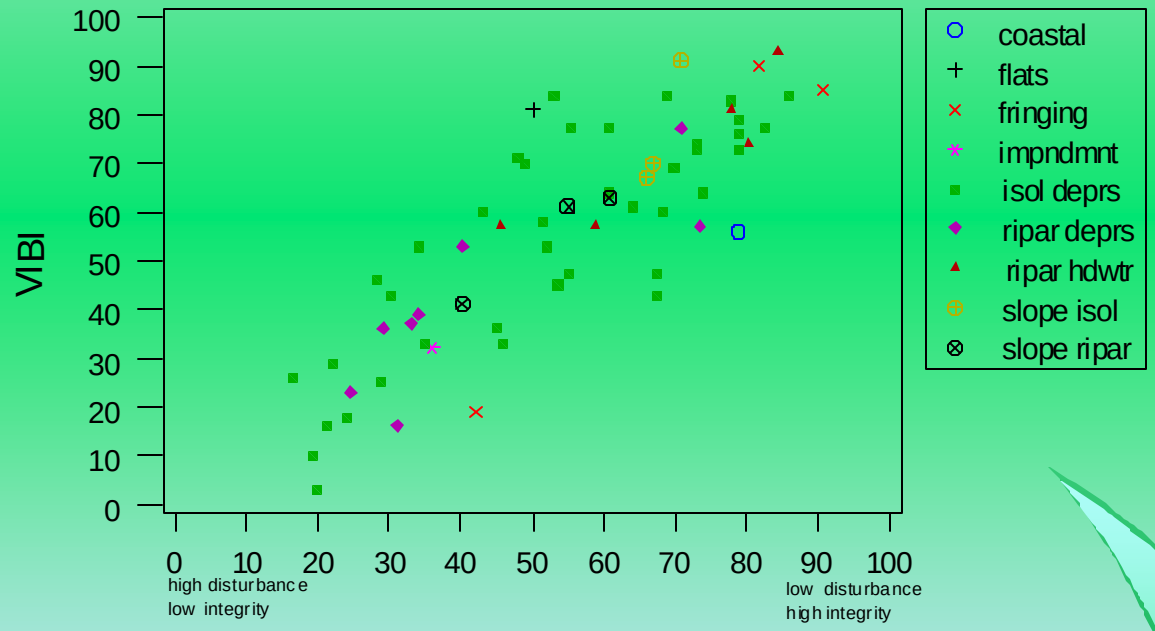
Developing Wetland IBIs



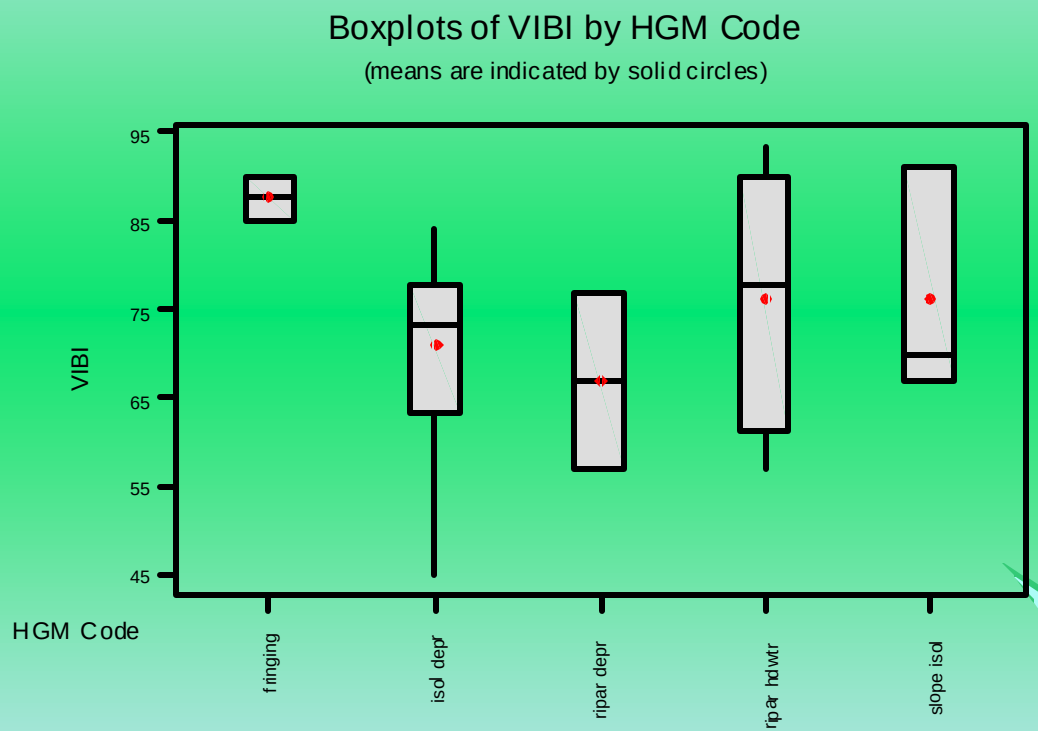


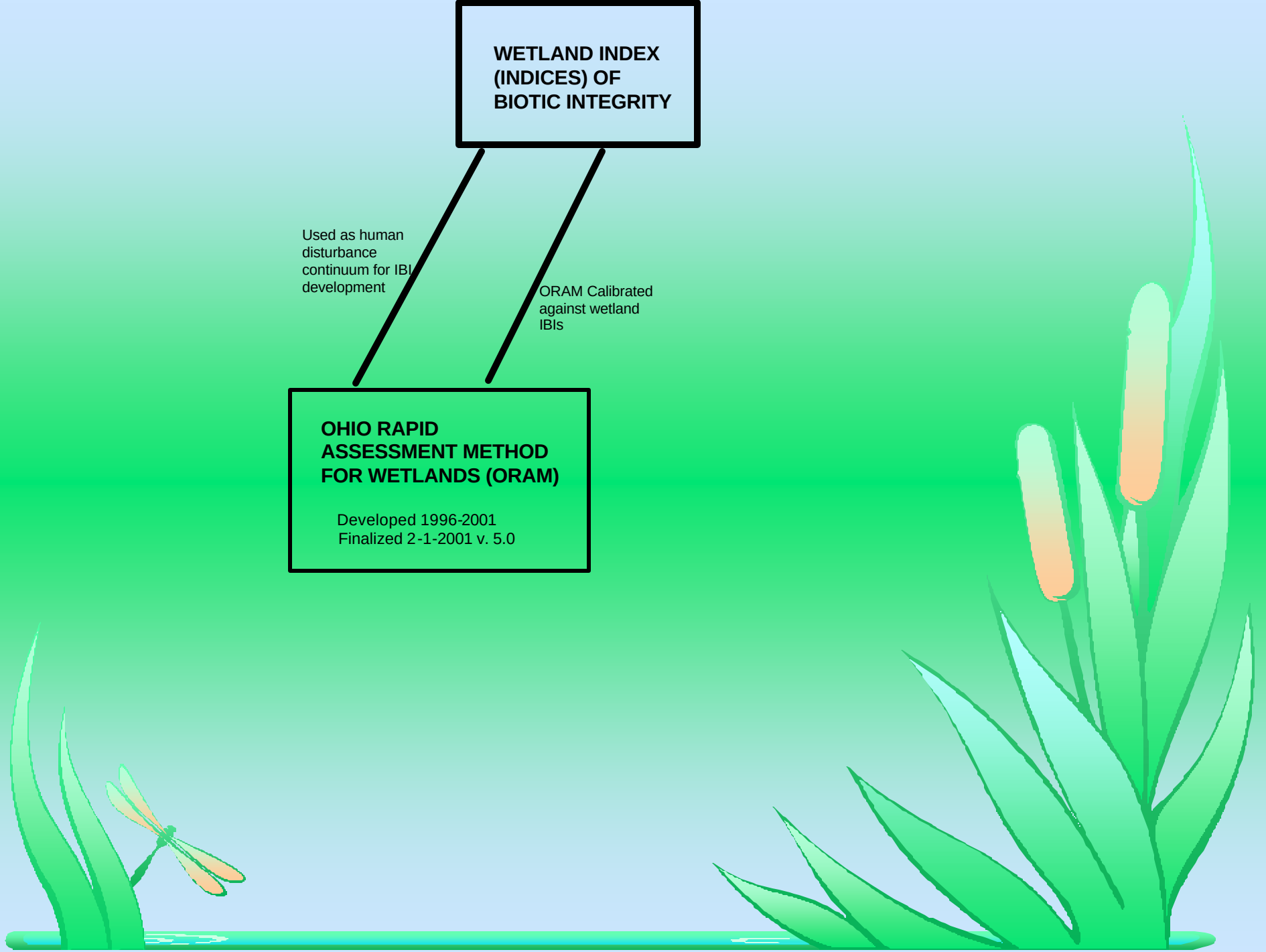
Using Biocriteria to Define Regulatory Categories

Developing Wetland IBIs

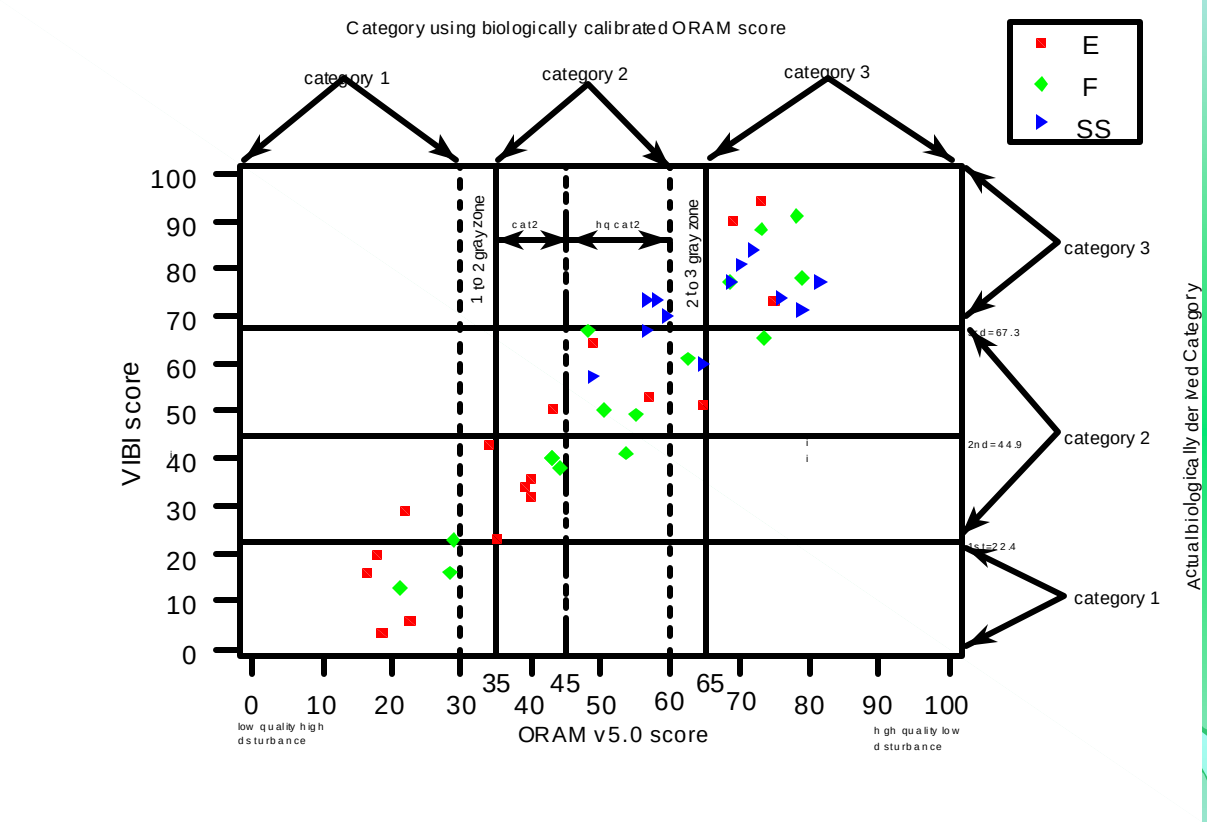


Developing Wetland IBIs




WETLAND INDEX (INDICES) OF BIOTIC INTEGRITY
Used as human disturbance continuum for IBI development
ORAM Calibrated against wetland IBIs
OHIO RAPID ASSESSMENT METHOD FOR WETLANDS (ORAM)
Developed 1996-2001
Finalized 2-1-2001 v. 5.0

Using Biocriteria to Define Regulatory Categories



Using Biocriteria to Define Regulatory Categories

Table 2. Interim scoring breakpoints for wetland regulatory categories for ORAM and VIBI scores.

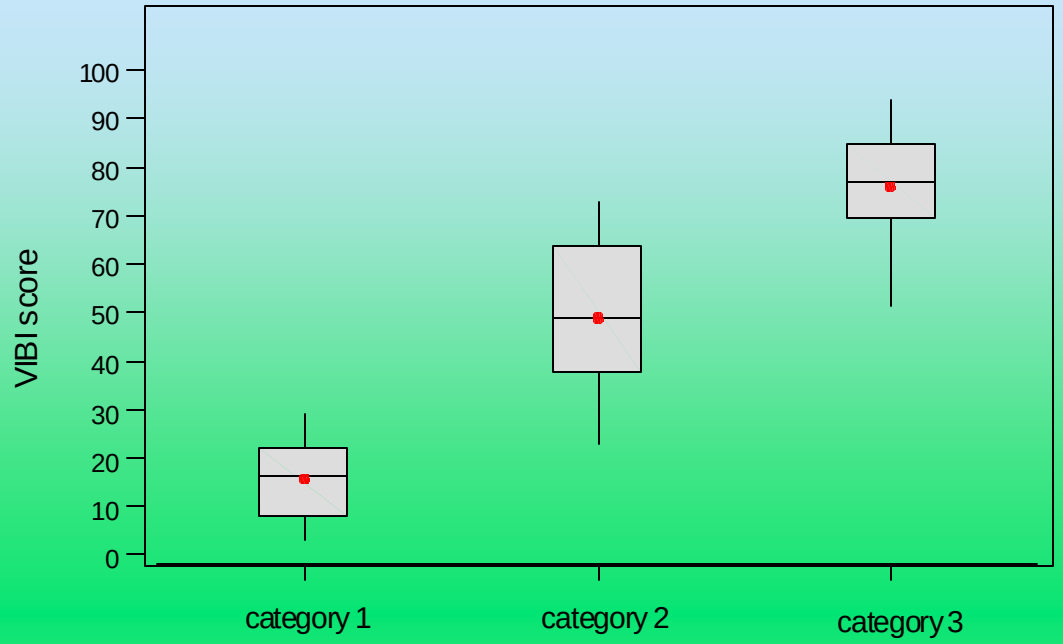
category	ORAM v. 5.0 score	VIBI score
1	0 - 29.9	0 - 21
1 or 2 gray zone	30 - 34.9	----
modified 2	35 - 44.9	22 - 44
2	45 - 59.9	45 - 66
2 or 3	60 - 64.9	----
3	65 - 100	67 - 100

ORAM used to define most wetland categories to implement WWQS and anti-deg requirements

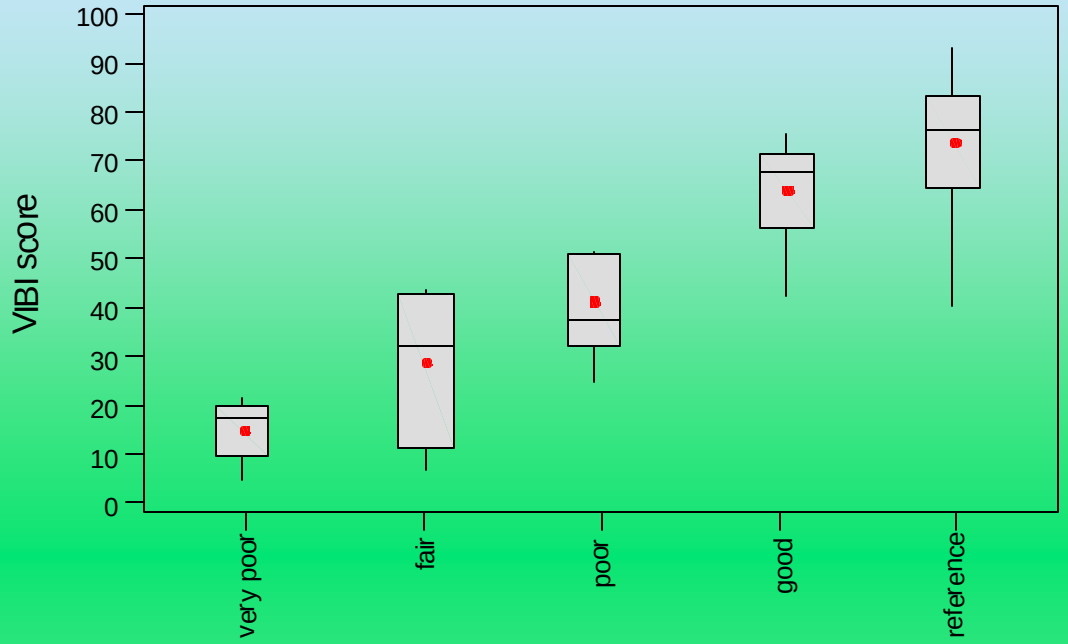
- **PERMIT DECISION-MAKING PROCESS**
- OEPA existing 401 rules ca 1980- present
- Increasing use of antidegradation requirements ca 1990 present

OHIO RAPID ASSESSMENT METHOD FOR WETLANDS (ORAM)

Developed 1996-2001
Finalized 2-1-2001 v. 5.0



Using Biocriteria to Define Regulatory Categories



Using Biocriteria to Define Regulatory Categories

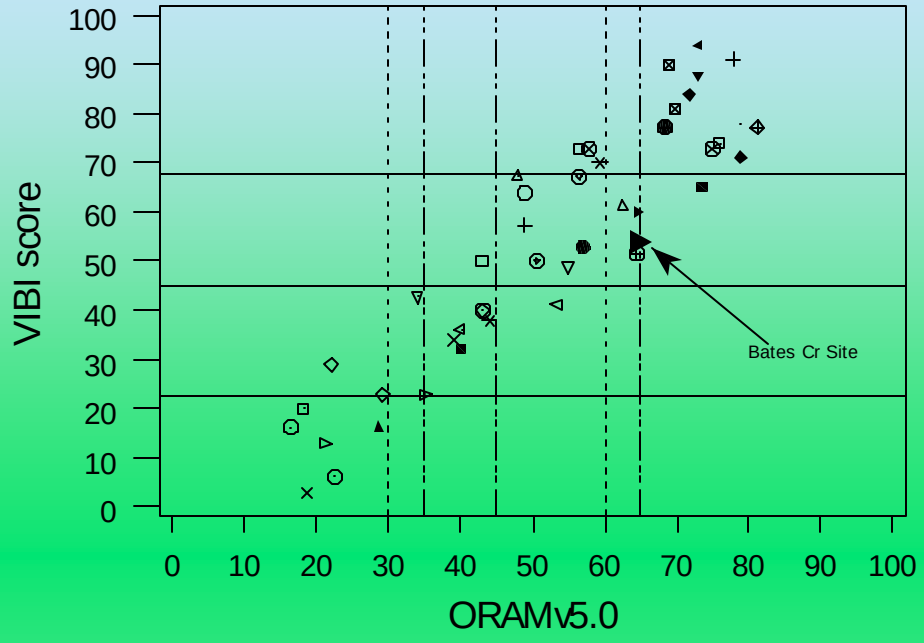
Using biological data to support individual permit actions

EXAMPLE

- After the fact, permit for small to mid-sized headwater marsh to Cuyahoga River
- Issue: Is wetland moderate (Cat 2) or high quality (Cat 3) wetland? If Category 2, then NWP for action usable. If not, then individual permit needed.
- Rapid assessment method and professional judgment divided on category.
- Sampled using Vegetation IBI procedures:

Using Biological Data to Support Individual Permit Actions

- Voucher review - 2 hours
  - Experienced field botanist
- Sampling in field - 3 hours
  - Experienced sampling team
  - Excluding travel time
- Calculation of VIBI - 0.5 hours



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Using Biological Data to Support Individual Permit Actions

EXAMPLE

Table 1. General Wetland Aquatic Life Use Designations using Vegetation IBIs.

code	designation	definition
SWLH	Superior Wetland Habitat	Wetlands that support and maintain a superior or unusual community of vascular plants
WLH	Wetland Habitat	Wetlands that are capable of supporting and maintaining a balanced, integrated, adaptive community of vascular plants
RWLH	Restorable Wetland Habitat	Wetlands which are degraded but have a reasonable potential for regaining the capability of supporting and maintaining a balanced, integrated, adaptive community of vascular plants
LWLH	Limited Wetland Habitat	Wetlands which are seriously degraded and which do not have a reasonable potential for regaining the capability of supporting and maintaining a balanced, integrated, adaptive community of vascular plants

Table 2. Specific wetland use designations.

Use code	specific use designation	Landscape position use designation modifier
Ia	Swamp forest	(1) riparian headwater depression, (2) riparian mainstem depression, (3) isolated depression, (4) lacustrine, (5) human impoundment, (6) beaver impoundment
Ib	Vernal pool	
Ic	Forest seeps	(1) riparian, (2) isolated, (3) lacustrine
Id	Tamarack-hardwood bog	
IIa	Mixed shrub swamp	Same as Ia above
IIb	Buttonbush swamp	Same as Ia above
IIc	Alder swamp	Same as Ia above
IId	Tall shrub bog	
IIe	Tall shrub fen	(1) riparian, (2) isolated, (3) lacustrine
IIIa	Marshes	Same as Ia above
IIIb	Sedge-grass communities	Same as Ia above
IIIc	Riverine marsh communities	
IIId	Fens	(1) riparian, (2) isolated, (3) lacustrine
IIIe	Bogs	
IV	Coastal marshes	(1) restricted, (2) unrestricted, (3) estuarine

Table 3. Special wetland use designations.

subscript	special uses	description
A	recreation	wetlands with known recreational uses including hunting, fishing, birdwatching, etc. that are publicly available
B	education	wetlands with known educational uses, e.g. nature centers, schools, etc.
C	fish reproduction habitat	wetlands that provide important reproductive habitat for fish
D	bird habitat	wetlands that provide important breeding and nonbreeding habitat for birds
E	flood storage	wetlands located in landscape positions such that they have flood retention functions
F	water quality improvement	wetlands located in landscape positions such that they can perform water quality improvement functions for streams, lakes, or other wetlands

Example

The wetland being evaluated is a pumpkin ash (*Fraxinus profunda*) swamp in Fowler Woods State Nature Preserve. This is a swamp forest in an non-riparian landscape position. After a detailed vegetation survey, a Vegetation IBI score of 81 is calculated. Referring to Table 2, this wetland receives a specific use designation of Ia3 (swamp forest-isolated depression). Referring to Table 4, a Vegetation IBI score of 81 is in the EWLH (Exceptional Wetland Habitat) use scoring range. Finally, Table 3 is consulted and it is determined that the wetland has educational uses as a state nature preserve that is open to the public. The Wetland Aquatic Life use designation can then summarized as,

$$SWLP\text{-}Ia3_B$$

where SWLH=means Superior Wetland Habitat,

Ia3=Isolated Swamp Forest,

and the subscript $_B$=education use.

Table 4. Pilot numeric biological criteria for wetlands based on Vegetation IBI breakpoints for specific plant communities and landscape positions. tbd's to be developed.

Landscape position	plant community	specific use code(s)	LQWLH	RWLH	WLH	SWLH
Riparian mainstem depressions	swamp forests shrub swamps	Ia2, IIa2, IIb2, IIc2	0-16	17-33	34-50	51-100
All landscape positions except riparian mainstem depressions	swamp forests vernal pool shrub swamp	all use codes except Ia2, IIa2, IIb2, IIc2	0-22	23-45	46-66	67-100
All landscape positions except coastal and riverine	marshes	IIIa-ECBP	0-16	17-33	34-50	51-100
		IIIa-EOLP	0-20	21-41	42-62	63-100
All landscape positions	bog fen sedge-grass	Id, IId, IIe, IIIb, IIId, IIIe	0-23	24-47	48-71	72-100
Coastal	all	all use codes	tbd	tbd	tbd	tbd
Riverine	all	n/a	tbd	tbd	tbd	tbd

- **WATERSHED CONDITION ASSESSMENT**
  Pilot - Project 3 Grant J172 ~2002-2003
- CORRELATING STREAM HEALTH TO WETLAND HEALTH BY WATERSHED
- TMDL APPLICATIONS
- GIS APPLICATIONS
  Lower Cuyahoga GIS wetland restoration suitability pilot project, 1998
- PLANNING
- TRACKING Acreage loss/gain, function lost/gain, type loss/gain

MITIGATION WETLAND PROGRAM

- Permit conditions
- Construction
- Inspection
- Enforcement
- Monitoring
- Performance
- Local, Regional Functional and in-kind replacement

UNDER DEVELOPMENT
Project 2 Grant J172
2001-2002 plus earlier
1997 Mitigation
Performance Study

Conclusions

- Wetland bioassessment and the IBIs developed from it can be the centerpiece of a wetland regulatory program
- Wetland IBIs are multipurpose and cost effective given multiple uses
  - Define regulatory categories
  - Aid in regulatory decision-making
  - Calibrate rapid assessment methods
  - Adaptable to mitigation monitoring
  - Used to establish numeric and narrative water quality standards
  - Adaptable to watershed, regional, or even statewide wetland condition assessment